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Substitute for form 1449/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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**Complete if Known**

Application Number	10/716,721
Filing Date	November 19, 2003
First Named Inventor	Yakobson, et al.
Art Unit	1754
Examiner Name	Unknown
Attorney Docket Number	11321-P057US

Sheet 1 of 6

## U. S. PATENT DOCUMENTS

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Sheet

2

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6

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SLH		Ebbesen, et al., "Large-Scale Synthesis of Carbon Nanotubes", Nature, Vol. 358 (July 16, 1992), pp. 220-222	
		Ebbesen, et al., "Carbon Nanotubes", Annual Review of Materials Science, Vol. 24 (1994), pp. 235-264	
		Iijima, et al., "Helical microtubules of graphite carbon, Nature, Vol. 354 (Nov. 7, 1991), pp. 56-58	
		Iijima, et al., "Single-Shell Carbon Nanotubes of 1 nm Diameter", Nature, Vol. 363 (1993), pp. 603-605	
		Bethune, et al., "Cobalt-catalyzed growth of carbon nanotubes with single-atomic-layer walls", Nature, Vol. 63 (1993), pp. 605-607	
		Ajayan, et al., "Growth morphologies during cobalt-catalyzed single-shell carbon nanotube synthesis", Chem. Phys. Lett., Vol. 215 (1993), pp. 509-517	
		Zhou, et al., "Single-Walled Carbon Nanotubes Growing Radially From YC2 Particles", Appl. Phys. Lett., Vol. 65 (1994), pp. 1593-1595	
		Seraphin, et al., "Nanocrystals into Carbon Clusters" J. Electrochem. Soc., Vol. 142 (1995), pp. 290-297	
		Saito, et al., "Carbon Nanocapsules Encaging Metals and Carbides" J. Phys. Chem. Solids, Vol. 54 (1993), pp. 1849-1860	
		Saito, et al., "Extrusion of single-wall carbon nanotubes via formation of small particles....." Chem. Phys. Lett., Vol. 236 (1995), pp. 419-426	

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Sheet

3

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6

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SLW		Lambert, et al., "Improving conditions toward isolating single-shell carbon nanotubes" Chem. Phys. Lett., Vol. 226 (1994), pp. 364-371	
		Rao, et al., "Functionalised carbon nanotubes from solutions", Chem. Commun. (1996), pp. 1525 - 1526	
		Wong, et al., "Covalently functionalized nanotubes as nanomtresized probes in chemistry and biology", Nature, Vol. 394 (1998), pp. 52-55	
		Liu, et al., "Fullerene Pipes", Science, Vol. 280 (1998), pp. 1253-1256	
		Chen, et al., "Solution Properties of Single-Walled Carbon Nanotubes", Science, Vol. 282 (1998), pp. 95-98	
		Cahill, et al., "Theoretical Studies of derivatized Buckyballs and Buckytubes", Tetrahedron, Vol., 52 (1996), pp. 5247-5256	
		Rinzler, et al., "Large-scale purification of single-wall carbon nanotubes: process, product and characterization", Appl. Phys. A, Vol. 67 (1998), pp. 29-37	
		Gonzalez, et al., "Synthesis and In Vitro Characterization of a Tissue-Selective Fullerene: Vectoring C60(OH)16AMBP .....", Bioorg. Med. Chem. (2002), pp. 1991-97	
		Saunders, et al., "Noble Gas Atoms Inside Fullerenes", Science, Vol. 271 (1996), pp. 1693-1697	
		Chai, et al., "Fullerenes With Metals Inside", J. Phys. Chem., Vol. 95 (1991), pp. 7564-7568	

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		Art Unit	1754
		Examiner Name	Unknown
Sheet 4	of 6	Attorney Docket Number	11321-P057US

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SLN		Dressalhaus, et al., "Science of Fullerenes and carbon Nanotubes", Academic Press, (1996), Chap. 19, pp. 756-761	
		Issi, et al., "Electronic Properties of Carbon Nanotubes: Experimental Results", Carbon, Vol. 33 (1995), pp. 941-948	
		Cornwell, et al., "Proposed growth mechanism of single-walled carbon nanotubes", Chem. Phys. Lett, Vol. 278 (1997), pp. 262-266	
		Dillon, et al., "Storage of hydrogen in single-walled carbon nanotubes", Nature, Vol. 386 (1997), pp. 377-389	
		Aihara, "Lack of Superaromaticity in Carbon Nanotubes", J. Phys. Chem., Vol. 98 (1994), pp. 9773-9776	
		Lagow, et al., "Some New Synthetic Approaches to Graphite-Fluorine Chemistry", J. Chem. Soc. Dalton Trans., Vol. 12 (1974), pp. 1268-1273	
		Taylor, et al., "Nucleophilic Substitution of Fluorinated C60", J. Chem. Soc. Chem. Comm., Vol. 9 (1992), pp. 665-667	
		Taylor, "General and Inorganic Chemistry", Russian Chem. Bull., Vol. 47 (1998), pp. 823-832	
		Watanabe, et al., "Graphite fluorides" (1998), Elsevier, Amsterdam <i>table of contents only</i>	
		Kamarchik, et al., "Poly(carbon monofluoride): A Solid, Layered Fluorocarbon", Acc. Chem. Res. Vol. 11 (1978), pp. 196-300	

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Sheet

5

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6

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		Hamwi, et al., "Fluorination of Carbon Nanotubes", Carbon, Vol. 35 (1997), pp. 723-728	
		Richter, et al., "Theory of Size-Dependent Resonance Raman Scattering from Carbon Nanotubes", Phys. Rev. Lett., Vol. 79 (1997), pp. 2738-2741	
		Rao, et al., "Diameter-Selective Raman Scattering from Vibrational Modes in Carbon Nanotubes", Science, Vol. 275 (1998), pp. 187-191	
		Bozhko, et al., "Resistance vs. pressure of single-wall carbon nanotubes", Appl. Phys. Vol. 67 (1998), pp. 75-77	
		Boltalina, et al., "Formation of C60F48 and fluorides of higher fullerenes", J. Chem. Soc., Perkin Trans., Vol. 2 (1996), pp. 2275-2278	
		Thess, et al., "Crystalline Ropes of Metallic Carbon Nanotubes", Science, Vol. 273 (1996), pp. 483-487	
		Dunitz, et al., "Organic Fluorine Hardly Ever Accepts Hydrogen Bonds", R. Eur. J. Chem. Vol. 3(1) (1997), pp. 89-98	
		Howard, et al., "How Good is Fluorine as a Hydrogen Bond Acceptor?", Tetrahedron, Vol. 52 (38) (1996), pp. 12613-12622	
		Harrell, et al., "Strong Hydrogen Bonds. II The Hydrogen Difluoride Ion" JACS, Vol. 86 (1964), pg. 4497	

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54A		Kniaz, et al., "Fluorinated Fullerenes: Synthesis, Structure and Properties", J. Am. Chem. Soc., Vol. 115 (1993), pp. 6060-6064	
		Fang, et al., "Raman scattering study of coalesced single walled carbon nanotubes", J. Mat. Res. Vol. 13 (1998), pp. 2405-2411	
		Mickelson, et al., "Methylated and phenylated C60 from Fluorinated fullerene precursors", J. Fluorine Chem., Vol. 92(1) (1998), pp. 59-62	
		Taylor, R., "The Chemistry of Fullerenes" (R. Taylor Ed.), World Scientific Publishing, London (1995), pp. 208-209	
		Gakh, et al., "Selective Synthesis and Structure determination of C60F48", J. Am. Chem. Soc., Vol. 116 (1994), pp. 819-820	
		Tellgmann, et al., "Endohedral fullerene production", Nature, Vol. 382 (1996), pp. 407-408	
		Mickelson, et al., "Fluorination of single-wall carbon nanotubes", Chem. Phys. Lett., Vol. 296 (1998), pp. 188-194	
		Hirsch, A., "Functionalization of Single-Walled Carbon Nanotubes", Angew. Chem. Int. Ed., Vol. 41(11) (2002), pp. 1853-1859	
		Boul, et al., "Reversible sidewall functionalization of buckytubes", Chem. Phys. Lett., Vol. 310 (1999), pp. 367-372	

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